

AMENDMENTS

In the Claims

1. **(Currently Amended)** An apparatus comprising:
a network interface element configured to receive an inbound packet at a line rate; and
a control element, wherein
 said control element is coupled to said network interface element, [[and]]
 said control element is configured to determine a packet priority associated with
 said inbound packet substantially at said line rate,
 said control element comprises
 a first buffer configured to store said inbound packet, and
 an inbound queue manager configured to store at least a portion of
 said inbound packet using a second buffer, and
 said second buffer is substantially larger than said first buffer.
2. **(Cancelled)**
3. **(Currently Amended)** The apparatus of claim [[2]] 1, wherein said control
element comprises:
a control element configured to perform rate limiting on a plurality of packets including
 said inbound packet substantially at said line rate.
4. **(Currently Amended)** The apparatus of claim [[2]] 1, wherein said
inbound queue manager comprises a buffer usage manager.
5. **(Currently Amended)** The apparatus of claim [[2]] 1, wherein said control
element comprises:
a control element configured to determine a class of service associated with said inbound
 packet.
6. **(Original)** The apparatus of claim 5, wherein

said inbound packet comprises a header and a tail; and

said control element further comprises:

an inbound receiver comprising said first buffer;

a lookup circuit coupled to said inbound receiver and configured to compare said header to a data structure and to determine routing information; and

a first packet modifier circuit configured to modify said header according to at least said routing information to form a modified packet;

7. (Original) The apparatus of claim 6, wherein said inbound queue manager comprises:

an inbound queue manager coupled to said first packet modifier circuit and configured to store said modified packet using said second buffer.

8. (Original) The apparatus of claim 6, wherein said data structure comprises an M-way branching tree structure.

9. (Currently Amended) The apparatus of claim ~~[[2]]~~ 1, wherein said control element further comprises:

an outbound receiver comprising a third buffer configured to store an outbound packet substantially at said line rate;

a second packet modifier circuit configured to modify said outbound packet substantially at said line rate; and

an outbound queue manager coupled to said second packet modifier circuit and configured to store said outbound packet using a fourth buffer, wherein said fourth buffer is substantially larger than said third buffer.

10. (Currently Amended) A method comprising:

storing an inbound packet using a network interface, wherein

said storing comprises storing an inbound packet using a first buffer of said network interface; [[and]]

determining a packet priority associated with said inbound packet substantially at a line rate of said network interface; and

storing at least a portion of said inbound packet using a second buffer of said network interface in response to said determining, wherein said second buffer is substantially larger than said first buffer.

11.-12. (Cancelled)

13. (Currently Amended) The method of claim ~~[[12]]~~ 10, further comprising: performing rate limiting on a plurality of packets including said inbound packet substantially at said line rate of said network interface.

14. (Currently Amended) The method of claim ~~[[12]]~~ 10, wherein said determining comprises: determining a class of service associated with said inbound packet.

15. (Original) The method of claim 14, wherein said inbound packet comprises a header and a tail; and said method further comprises:
comparing said header to a data structure substantially at said line rate of said network interface;
determining routing information substantially at said line rate of said network interface; and
modifying said header according to at least said routing information to form a modified packet substantially at said line rate of said network interface.

16. (Original) The method of claim 15, wherein said comparing comprises: comparing said header to an M-way branching tree structure.

17. (Original) The method of claim 15, wherein said storing at least a portion of said inbound packet using a second buffer of said network interface in response to said determining comprises:
storing said modified packet using said second buffer.

18. (Original) The method of claim 17, wherein said storing said modified packet using said second buffer comprises:
managing buffer usage.

19. (Currently Amended) The method of claim ~~[[12]]~~ 10, further comprising:
storing an outbound packet using a third buffer of said network interface;
modifying said outbound packet substantially at said line rate of said network interface;
and
storing said outbound packet using a fourth buffer of said network interface in response to said modifying, wherein
said fourth buffer is substantially larger than said third buffer.

20. (Currently Amended) A ~~machine~~ computer-readable storage medium having a plurality of instructions executable by a ~~machine~~ computer embodied therein, wherein said plurality of instructions when executed cause said ~~machine~~ computer to perform a method comprising:

storing an inbound packet using a network interface, wherein
said storing comprises storing an inbound packet using a first buffer of said
network interface; [[and]]
determining a packet priority associated with said inbound packet substantially at a line rate of said network interface; and
storing at least a portion of said inbound packet using a second buffer of said
network interface in response to said determining, wherein
said second buffer is substantially larger than said first buffer.

21.-22. (Cancelled)

23. (Currently Amended) The ~~machine~~ computer-readable storage medium of claim ~~[[22]]~~ 20, said method further comprising:
performing rate limiting on a plurality of packets including said inbound packet substantially at said line rate of said network interface.

24. (Currently Amended) The ~~machine~~ computer-readable storage medium of claim ~~[[22]]~~ 20, wherein said determining comprises:
determining a class of service associated with said inbound packet.

25. (Currently Amended) The ~~machine~~ computer-readable storage medium of claim 24, wherein

said inbound packet comprises a header and a tail; and
said method further comprises:

comparing said header to a data structure substantially at said line rate of said network interface;
determining routing information substantially at said line rate of said network interface; and
modifying said header according to at least said routing information to form a modified packet substantially at said line rate of said network interface.

26. (Currently Amended) The ~~machine~~ computer-readable storage medium of claim ~~[[22]]~~ 20, said method further comprising:

storing an outbound packet using a third buffer of said network interface;
modifying said outbound packet substantially at said line rate of said network interface; and
storing said outbound packet using a fourth buffer of said network interface in response to said modifying, wherein
said fourth buffer is substantially larger than said third buffer.

27. (Currently Amended) An apparatus comprising:

means for storing an inbound packet using a network interface, wherein

said means for storing comprises means for storing an inbound packet using a first buffer of said network interface; [[and]]

means for determining a packet priority associated with said inbound packet substantially at a line rate of said network interface; and

means for storing at least a portion of said inbound packet using a second buffer of said network interface, wherein

said second buffer is substantially larger than said first buffer.

28.-29. (Cancelled)

30. (Currently Amended) The machine-readable medium of claim ~~[[29]]~~ 27, further comprising:

means for performing rate limiting on a plurality of packets including said inbound packet substantially at said line rate of said network interface.

31. (Currently Amended) The apparatus of claim ~~[[29]]~~ 27, wherein said means for determining comprises:

means for determining a class of service associated with said inbound packet.

32. (Original) The apparatus of claim 31, wherein said inbound packet comprises a header and a tail; and

said apparatus further comprises:

means for comparing said header to a data structure substantially at said line rate of said network interface;

means for determining routing information substantially at said line rate of said network interface; and

means for modifying said header according to at least said routing information to form a modified packet substantially at said line rate of said network interface.

33. (Currently Amended) The apparatus of claim ~~[[29]]~~ 27, further comprising:

means for storing an outbound packet using a third buffer of said network interface;

means for modifying said outbound packet substantially at said line rate of said network interface; and

means for storing said outbound packet using a fourth buffer of said network interface in response to said modifying, wherein

said fourth buffer is substantially larger than said third buffer.